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| 10/671,583 | 09/29/2003 | Masaaki Hiroki | 0756-7195 | 9990 |

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| EXAMINER | |
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| LESPERANCE, JEAN E | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2674 | |

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/671,583 | HIROKI, MASAAKI | |
| | Examiner | Art Unit | |
| | Jean E. Lesperance | 2674 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. The amendment filed October 7, 2005 is entered and claims 1-19 are pending.

### *Response to Arguments*

2. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent # 5,847,688 by Ohi et al. in view of US Patent # 5,049,998 by Lee.

Regarding claim 1, Ohi et al. teach a method of driving a display device (a liquid crystal display being driven on the basis of an output of the gamma conversion means (column 3, lines 22 and 23)) comprising the steps of:

providing an original video signal (video input signal (RGB) Fig.6 (11));

modifying the original video signal to a pair of video signals having a reversal relation to each other (The six inverting circuits 16 are controlled by an inversion control signal V.sub.INV so that each pair of inverting circuits 16 output voltage signals

opposite to each other in polarity. In this case, the R, G and B signals corresponding to the same pixel are gamma-converted in accordance with the same gamma characteristics (column 5, lines 61-67));

inputting the pair of video signals to one source driver circuit (two video signals going to H-driver (upper) and H-driver (lower) Fig.6 (3). Accordingly, the prior art teaches all the claimed limitations with the exception of providing applying one of the pair of video signals to an odd signal line of the signal lines of the pixel region and applying the other of the pair of video signals to an even signal line of the signal lines of a pixel region.

However, Lee teaches decimation means for separating said input video signal into two separate signals, a first one of said two separate signals representative of odd pixels of said input video signal and a second one of said two separate signals representative of even pixels of said input video signal, and for sampling said first one of said two separate signals for outputting a first sampled signal and for sampling said second one of said two separate signals for outputting a second sampled signal, said two separate signals also being provided as outputs of said decimation means (column 6, lines 38-49).

Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the two separate signals as taught by Lee in the liquid crystal display disclosed by Ohi et al. because this would provide a picture quality improving circuit which is capable of improving picture quality by interpolating the sampling video signal outputted from the video camera.

Regarding claim 2, Ohi et al. teach a method of driving a display device (a liquid crystal display being driven on the basis of an output of the gamma conversion means (column 3, lines 22 and 23)) comprising the steps of:

providing an original video signal (video input signal (RGB) Fig.6 (11));

modifying the original video signal to a pair of video having symmetry with reference to a potential of an opposite electrode provided opposite to pixel electrodes (The six inverting circuits 16 are controlled by an inversion control signal V.sub.INV so that each pair of inverting circuits 16 output voltage signals opposite to each other in polarity. In this case, the R, G and B signals corresponding to the same pixel are gamma-converted in accordance with the same gamma characteristics (column 5, lines 61-67));

inputting the pair of video signals to one source driver circuit (two video signals going to H-driver (upper) and H-driver (lower) Fig.6 (3)). Accordingly, the prior art teaches all the claimed limitations with the exception of providing applying one of the pair of video signals to an odd signal line of the signal lines of a pixel region and applying the other one of the pair of video signals to an even signal line of the signal lines of a pixel region.

However, Lee teaches decimation means for separating said input video signal into two separate signals, a first one of said two separate signals representative of odd pixels of said input video signal and a second one of said two separate signals representative of even pixels of said input video signal, and for sampling said first one of said two separate signals for outputting a first sampled signal and for sampling said

second one of said two separate signals for outputting a second sampled signal, said two separate signals also being provided as outputs of said decimation means (column 6, lines 38-49).

Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the two separate signals as taught by Lee in the liquid crystal display disclosed by Ohi et al. because this would provide a picture quality improving circuit which is capable of improving picture quality by interpolating the sampling video signal outputted from the video camera.

Regarding claim 3, Ohi et al. teach a method of driving a display device (a liquid crystal display being driven on the basis of an output of the gamma conversion means (column 3, lines 22 and 23)) comprising the steps of:

providing an original video signal (video input signal (RGB) Fig.6 (11));

modifying the original video signal to a pair of video signals having a reversal relation to each other (The six inverting circuits 16 are controlled by an inversion control signal V.sub.INV so that each pair of inverting circuits 16 output voltage signals opposite to each other in polarity. In this case, the R, G and B signals corresponding to the same pixel are gamma-converted in accordance with the same gamma characteristics (column 5, lines 61-67));

inputting the pair of video signals to one source driver circuit (two video signals going to H-driver (upper) and H-driver (lower) Fig.6 (3). Accordingly, the prior art teaches all the claimed limitations with the exception of providing applying one of the pair of video signals to an odd signal line of the signal lines of the pixel region and

applying the other of the pair of video signals to an even signal line of the signal lines of a pixel region.

However, Lee teaches decimation means for separating said input video signal into two separate signals, a first one of said two separate signals representative of odd pixels of said input video signal and a second one of said two separate signals representative of even pixels of said input video signal, and for sampling said first one of said two separate signals for outputting a first sampled signal and for sampling said second one of said two separate signals for outputting a second sampled signal, said two separate signals also being provided as outputs of said decimation means (column 6, lines 38-49).

Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the two separate signals as taught by Lee in the liquid crystal display disclosed by Ohi et al. because this would provide a picture quality improving circuit which is capable of improving picture quality by interpolating the sampling video signal outputted from the video camera.

Regarding claim 4, Ohi et al. teach a method of driving a display device (a liquid crystal display being driven on the basis of an output of the gamma conversion means (column 3, lines 22 and 23)) comprising the steps of:

providing an original video signal (video input signal (RGB) Fig.6 (11));

modifying the original video signal to a pair of video having symmetry with reference to a potential of an opposite electrode provided opposite to pixel electrodes (The six inverting circuits 16 are controlled by an inversion control signal V.sub.INV so

that each pair of inverting circuits 16 output voltage signals opposite to each other in polarity. In this case, the R, G and B signals corresponding to the same pixel are gamma-converted in accordance with the same gamma characteristics (column 5, lines 61-67));

inputting the pair of video signals to one source driver circuit (two video signals going to H-driver (upper) and H-driver (lower) Fig.6 (3)). Accordingly, the prior art teaches all the claimed limitations with the exception of providing applying one of the pair of video signals to an odd signal line of the signal lines of a pixel region and applying the other one of the pair of video signals to an even signal line of the signal lines of a pixel region.

However, Lee teaches decimation means for separating said input video signal into two separate signals, a first one of said two separate signals representative of odd pixels of said input video signal and a second one of said two separate signals representative of even pixels of said input video signal, and for sampling said first one of said two separate signals for outputting a first sampled signal and for sampling said second one of said two separate signals for outputting a second sampled signal, said two separate signals also being provided as outputs of said decimation means (column 6, lines 38-49).

Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the two separate signals as taught by Lee in the liquid crystal display disclosed by Ohi et al. because this would provide a picture quality

improving circuit which is capable of improving picture quality by interpolating the sampling video signal outputted from the video camera.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 5-10 are rejected under 35 U.S.C. 102(b) as being unpatentable over US Patent # 5,847,688 by Ohi et al..

Regarding claim 5, Ohi et al. teach a method of driving a display device (a liquid crystal display being driven on the basis of an output of the gamma conversion means (column 3, lines 22 and 23)) comprising the steps of:

providing an original video signal (video input signal (RGB) Fig.6 (11));

modifying the original video signal to at least one first video signal and at least one second video signal (The six inverting circuits 16 are controlled by an inversion control signal V.sub.INV so that each pair of inverting circuits 16 output voltage signals opposite to each other in polarity. In this case, the R, G and B signals corresponding to the same pixel are gamma-converted in accordance with the same gamma characteristics (column 5, lines 61-67));

applying the first video signal to a source of driver circuit through a second single video signal line (R (11), a video input signal is applied to a hold circuit Fig. 6 (14) which is applied to a H-driver upper (18), (see Fig.6)); and

applying the second video signal to a source of driver circuit through a first single video signal line (G (11), a video input signal is applied to a hold circuit Fig. 6 (14) which is applied to a H-driver upper (19), (see Fig.6)),

inverting polarities of signal potentials of the first video signal and second video signal in every frame period, wherein the first video signal has a reversal relationship with the second video signal (The gamma converted signals outputted from the six gamma conversion circuits 15 are fed through six inverting circuits 16 to upper and lower horizontal drivers 18 and 19 associated to an LCD panel 17. The six inverting circuits 16 are controlled by an inversion control signal V.sub.INV so that each pair of inverting circuits 16 output voltage signals opposite to each other in polarity (column 5, lines 58-64).

Regarding claim 6, Ohi et al. teach the display panel Fig.6 (17) where the pixel are opposite to each other.

Regarding claim 7, Ohi et al. teach the display panel Fig.8 (17) where the pixel are opposite to each other.

Regarding claim 8, Ohi et al. teach a method of driving a display device (a liquid crystal display being driven on the basis of an output of the gamma conversion means (column 3, lines 22 and 23)) comprising the steps of:

providing an original video signal (video input signal (RGB) Fig.6 (11));

modifying the original video signal to at least one first video signal and at least one second video signal (The six inverting circuits 16 are controlled by an inversion control signal V.sub.INV so that each pair of inverting circuits 16 output voltage signals opposite to each other in polarity. In this case, the R, G and B signals corresponding to the same pixel are gamma-converted in accordance with the same gamma characteristics (column 5, lines 61-67));

applying the first video signal to a source of driver circuit through a second single video signal line (R (11), a video input signal is applied to a hold circuit Fig. 6 (14) which is applied to a H-driver upper (18), (see Fig.6)); and

applying the second video signal to a source of driver circuit through a first single video signal line (G (11), a video input signal is applied to a hold circuit Fig. 6 (14) which is applied to a H-driver upper (19), (see Fig.6)),

inverting polarities of signal potentials of the first video signal and second video signal in every frame period, wherein the first video signal has a reversal relationship with the second video signal (The gamma converted signals outputted from the six gamma conversion circuits 15 are fed through six inverting circuits 16 to upper and lower horizontal drivers 18 and 19 associated to an LCD panel 17. The six inverting circuits 16 are controlled by an inversion control signal V.sub.INV so that each pair of inverting circuits 16 output voltage signals opposite to each other in polarity (column 5, lines 58-64).

Regarding claim 9, Ohi et al. a pixel dot (Fig.7) where voltage are opposite to each other.

Regarding claim 10, Ohi et al. teach a pixel dot (Fig.7) where voltage are opposite to each other corresponding to said display device is driven in a dot inversion method.

***Allowable Subject Matter***

5. Claims 13-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 11, 12 and 19 are allowed.

8. The following is an examiner's statement of reasons for allowance: the claimed invention is directed to a display device.

Independent claim 11 identifies a uniquely distinct feature "wherein the signal processing circuit is connected to the liquid crystal panel through a plurality of video signal lines, and includes D/A conversion circuits connected to the plurality of video signal lines, the number of D/A conversion circuits being equal to the number of video signal lines".

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ohi et al. (5,847,668) and Lee (5,049,998).

The closest arts, Ohi et al., and Lee as discussed above, either singularly or in combination, fail to anticipate or render obvious the above limitations obvious.

**Conclusion**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean Lesperance whose telephone number is (571) 272-7692. The examiner can normally be reached on from Monday to Friday between 10:OOAM and 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard, can be reached on (571) 272-7603.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

(571) 273-8300 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Jean Lesperance

Date 6/23/2005

PATRICK N. EDOUARD
SUPERVISORY PATENT EXAMINER

Art Unit 2674